

Catalogue of American Amphibians and Reptiles.

McCoy, C. J., and Richard C. Vogt. 1990. *Graptemys geographica*.

***Graptemys geographica* (Le Sueur)
Map Turtle**

Testudo geographica Le Sueur, 1817:86. Type-locality, "marsh, on the borders of Lake Erie." Holotype, not designated.

Emys geographica: Say, 1825:204.

Terrapene geographica: Bonaparte, 1830:156.

Emys megacephala Holbrook, 1836:51. Type-locality, "Cumberland River ... neighbourhood of Nashville [Davidson County], Tennessee." Holotype, Acad. Nat. Sci. Philadelphia 255, collected by Prof. Troost (examined by authors).

Graptemys geographica: Agassiz, 1857:436. First use of combination.

Emys macrocephala: Agassiz, 1857:436. *Lapsus*.

Clemmys geographica: Strauch, 1862:33.

Malacoclemmys geographica: Cope, 1875:53.

Malacoclemmys geographicus: Davis and Rice, 1883:32. Emendation.

Malaclemys geographica: Hay, 1887:219. *Lapsus*.

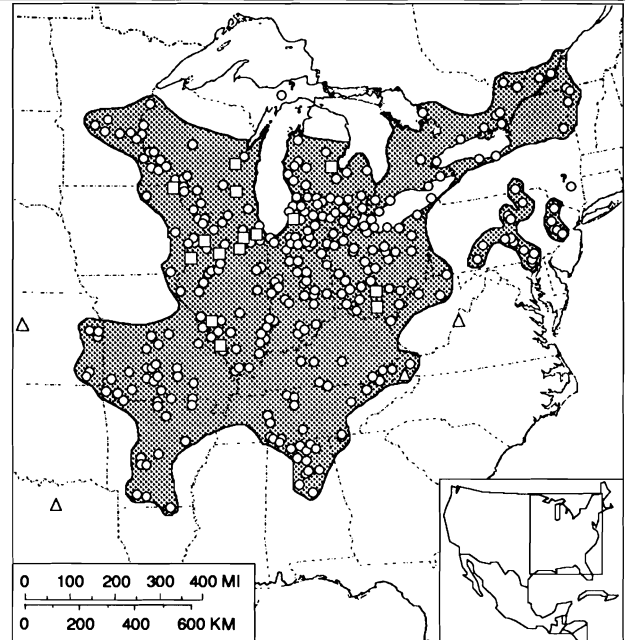
Malaclemys geographica: Hurter, 1893:261.

Malaclemmys geographicus: McLain, 1899:1.

- **Content.** No subspecies have been described.

- **Definition.** *Graptemys geographica* is a large, sexually dimorphic emydine: maximum carapace length in females is 27.3 cm, in males 16 cm. The smooth carapace is oval and elongate in dorsal view. Vertebral spines are present in hatchlings and juveniles, low in adult males and absent in adult females. The medial keel is low, and the posterior marginals are not strongly serrated. The carapace is olive green with a reticulate pattern of light yellow lines. The plastron is light yellow to cream, usually unmarked but sometimes with a pattern of concentric dark rings on the bridges; undersides of marginals are light with concentric dark markings. Head, neck, legs, and tail are dark green to black, with yellow to greenish-yellow stripes. A small, roughly triangular spot lies behind each eye, but is not connected to head stripes, and is separated from the orbit by two or three stripes. Adult males have longer tails, a more oval carapace with more prominent vertebral spines, and a narrower head. Adult females have a lower and smoother carapace. In molluscivorous populations the head may be greatly enlarged, with broadened crushing surfaces on the jaws, especially in older adult females (Iverson et al., 1989).

- **Descriptions.** Descriptions of the species are in Cahn



Map. Round symbols mark known Recent localities; square symbols are records from archeological sites; triangular symbols mark fossil (Pleistocene) localities. The imprecise type-locality, "borders of Lake Erie," is not marked. Question marks indicate uncertain range limits or questionable localities.

(1937), Carr (1952), Smith (1961), Ernst and Barbour (1972, 1989), Minton (1972), and Vogt (1981b). Killebrew (1977) described the karyotype ($2n=50$), and Campbell and Turner (1937) serum proteins.

- **Illustrations.** Black and white lithographs of a hatchling (dorsal, ventral and lateral views) are in Agassiz (1857). Diagrams of the head pattern are in Carr (1952) and Minton (1972). Cahn (1937) has a drawing of the alveolar aspect of the lower jaw and a photograph of eggs. Black and white photographs of the skull (dorsal, ventral and lateral views, male and female) are in Ernst and Barbour (1972), and of living animals in Carr (1952), Smith (1961), Anderson (1965), Ernst and Barbour (1972, 1989), Minton (1972), Mount (1975), and Collins (1982). Color illustrations are in Babcock (1919), Conant (1975; adult male and female, hatchling in dorsal and ventral views), Ernst and Barbour (1972), Martof, et al. (1980), Vogt (1981b), and Johnson (1987; including nest with eggs).

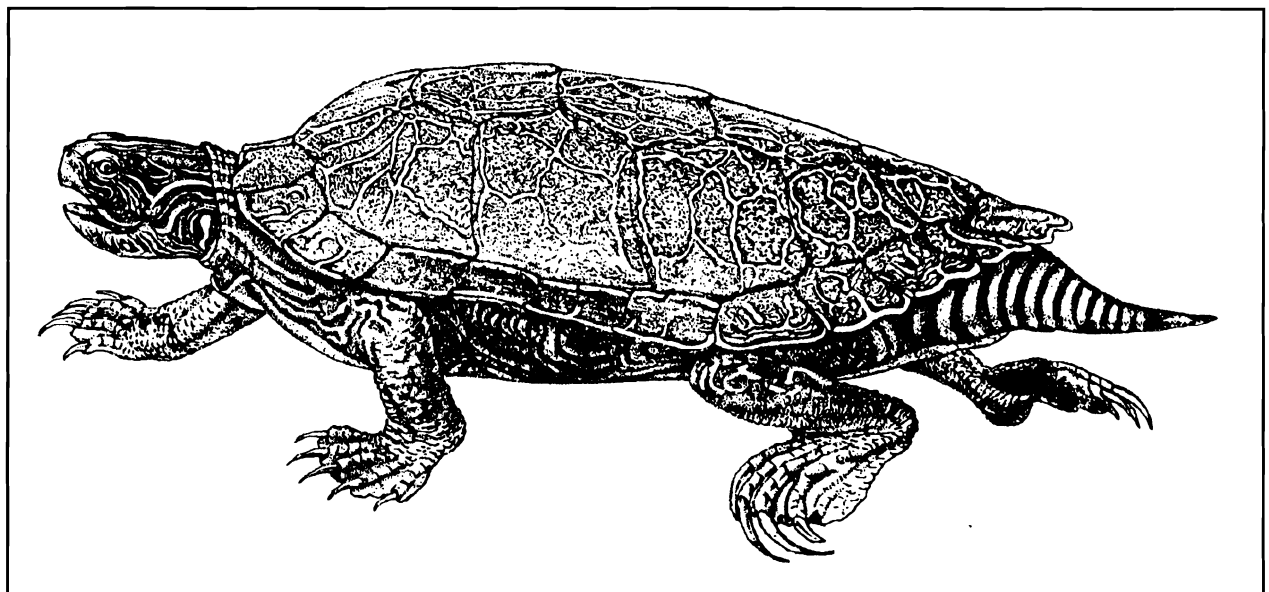


Figure. Drawing of *Testudo geographica* by C. A. Le Sueur, published with the original description of the species (Le Sueur, 1817).

• **Distribution.** *Graptemys geographica* ranges from southwestern Quebec and southern Ontario in the St. Lawrence Drainage, including lakes George and Champlain, westward through the Great Lakes Drainage to Wisconsin, the Mississippi Drainage from central Minnesota south to northern Louisiana and west to eastern Oklahoma and Kansas, throughout the Tennessee River Drainage, streams above the Fall Line in the Tombigbee River Drainage of Alabama, and the Ohio Drainage from West Virginia to Illinois. Isolated populations occur in the Susquehanna Drainage in Pennsylvania and Maryland, the Delaware River from the mouth northward to Sussex County, New Jersey, and the lower Hudson River, New York. Distribution records by state are in: Alabama (Mount, 1975); Illinois (Smith, 1961); Indiana (Minton, 1972); Kansas (Collins, 1982); Maryland (Harris, 1969); Michigan (Lagler, 1943; Holman, 1988); Minnesota (Ernst, 1973; Lang, 1984); Missouri (Johnson, 1987); New Jersey (Arndt and Potter, 1973); New York (Bishop, 1921; Kiviat and Buso, 1977); North Carolina (Martof, et al., 1980); Ohio (Conant, 1951; Adler, 1961); Pennsylvania (McCoy, 1982); Virginia (Tobey, 1985); West Virginia (Green and Pauley, 1987); and Wisconsin (Vogt, 1981b). The distribution in New England was described by Babcock (1919), and in Canada by Cook (1984). A general distribution spot-map of the species is in Iverson (1986). King and Burke (1989) gave the current check-list account.

• **Fossil Record.** *Graptemys geographica* have been found in Pleistocene deposits in Texas (Slaughter, et al., 1962; Holman, 1969), Kansas (Holman, 1972), Tennessee (Guilday, et al., 1978), and Virginia (Fay, 1988). Preston (1979) reviewed Pleistocene records from mid-continental sites. Adler (1968) and Jenkins and Semken (1972) reported records from archeological sites in the Midwest.

• **Pertinent Literature.** General accounts are in Cahn (1937), Carr (1952), Smith (1961), Ernst and Barbour (1972), Minton (1972), Vogt (1981b), and Johnson (1987). Ecology was studied by Newman (1906), Evermann and Clark (1916), Breckenridge (1944), Gordon and MacCulloch (1980), and Vogt (1980). Food habits were reported by Surface (1908), Lagler (1943), Lagler and Lagler (1944), Penn (1950), and Vogt (1981a). Iverson (1988) studied growth. Basking behavior was studied by Moll (1976), and Ecksdine (1985), and habitat utilization and movements by Flaherty and Bider (1984), and Pluto and Bellis (1986, 1988). Conant (1938) reported seasonal occurrence, and Minton (1968) noted persistence of populations in urban areas. Goodpaster and Hoffmeister (1952) reported rice rat predation. Aspects of temperature-dependent sex determination were reported by Bull and Vogt (1979), Bull, et al. (1982), Vogt and Bull (1984), and Bull (1985). Ewert (1979, 1985) reviewed embryology of the species. Parasites were studied by Stunkard (1917, 1919), Harrah (1922), Hughes, et al. (1941), Rausch (1946, 1947), Woo (1969), Pluto and Rothenbacher (1976), Wacha and Christiansen (1976), and Brooks (1979), and zoophytic algae by Edgren, et al. (1953). Ernst and Ernst (1977) summarized literature on endoparasitic helminths. Relationships were studied by Garman (1890), Hay (1892), Carr (1949), McDowell (1964), McKown (1972), Wood (1977), and Dobie (1981). Bleakney (1958) analyzed zoogeography of the species in eastern Canada, and Tinkle (1959) analyzed distribution in southern rivers in relation to the fall line. Anatomical studies are Schwarz and Schwarz (1980- brain); Maeda and Fitch (1981) and Maeda, et al. (1984- amino acid sequences); McDowell (1961- cranial arteries); Winokur (1988- buccopharyngeal mucosa); Winokur and Legler (1974- rostral pores; 1975- mental gland); Cowan (1969- orbital glands); Parsons (1960- choanae); Clark (1968- parathyroid glands); Gaffney (1979- skull); Williams (1950- cervical articulations); Richmond (1964- plastron); and Mosimann (1958- shell allometry). Physiological studies are Stitt and Semple (1971), Stitt, et al. (1970, 1971), Semple, et al. (1970), Akers and Damm (1963), Akers and Peiss (1963), Lange, et al. (1966), and Wells, et al. (1974).

• **Etymology.** The name *geographica* was given in allusion to the markings on the shell, which appear to resemble a "geographical map" (Le Sueur, 1817).

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C. J. McCoy, Carnegie Museum of Natural History, Pittsburgh, Pennsylvania 15213, U.S.A. and Richard C. Vogt, Estación de Biología "Los Tuxtlas," UNAM, Apartado Postal 94, San Andrés Tuxtla, Veracruz, México.

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